Dependable Products From People You Trust

High Temperature Aging Cells

Patent Pending

Part No.: 175-80

Instruction Manual

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Ver. 1.2

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Intro

The OFITE High Temperature Aging Cell is a pressure vessel that enables samples to be subjected to temperatures higher than the boiling point of water and still be maintained in a liquid state. The cells may be used for static temperature exposure or in a dynamic mode in a roller oven.

Specifications

- Maximum Temperature: 600°F (316°C)
- Maximum Pressure: 2,000 PSI (13.8 MPa)
- Material: 316 Stainless Steel (other alloys available)
- Capacity: 1,000 mL
- Size: 14.5” Tall × 4” Diameter (37 × 10 cm)
- Weight: 18.4 lb (8.3 kg)

Components

Included:

#170-17	O-ring for Valve Stem, Viton
#175-16	Valve Stem
#175-46	O-ring for Outside of Aging Cell Body, Teflon, Qty: 2
#175-80-010	Cell Body, 1 Liter
#175-80-002	Outer Cap
#175-80-003	Thrust Ring
#175-80-004	Tension Post
#175-80-005	Tension Ring
#175-80-006	Seal Ring
#175-80-007	Thrust Washer
#175-80-008	Set Screw
#175-15	Allen Wrench

Optional:

#175-46	O-ring for Outside of Aging Cell, Teflon® (Above 400°F)
#175-47	O-ring for Outside of Aging Cell, Viton® (Up to 400°F)
#175-54	O-ring for Outside of Aging Cell, Buna N (Below 200°F)
#175-80-015	Torque Wrench for Set Screw
#175-80-016	Socket, Hex Bit

Specifications

Maximum Temperature: 600°F (315.6°C)
Maximum Pressure: 2,000 PSI (13.8 MPa)

For tests above 200°F, refer to the chart below for the appropriate pressure.

Mud Volume and Pressure for High-Temperature Aging				
Aging Temp. (°F / °C)	**Water Vapor Pressure (PSI)**	**Coefficient of Expansion of Water**	**Suggested Applied Pressure (PSI / kPa)**	**Mud Volume (mL)**
212 / 100	14.7	1.04	25 / 172	900
250 / 121	30	1.06	50 / 345	900
300 / 149	67	1.09	100 / 690	850
350 / 176	135	1.12	150 / 1,034	400
400 / 204	247	1.16	250 / 1,724	750
450 / 232	423	1.20	300 / 2,069	750
500 / 260	680	1.27	375 / 2,586	650
550 / 287	1,100	1.36	500 / 3,448	550
600 / 315	1,543	1.47	500 / 3,448	500

Do not use nitrous oxide cartridges as pressure sources for high-temperature, high-pressure (HTHP) aging. Under high temperature and pressure, nitrous oxide can detonate in the presence of grease, oil, or carbonaceous materials. Nitrous oxide cartridges are to be used only for Garrett Gas Train Carbonate Analysis.

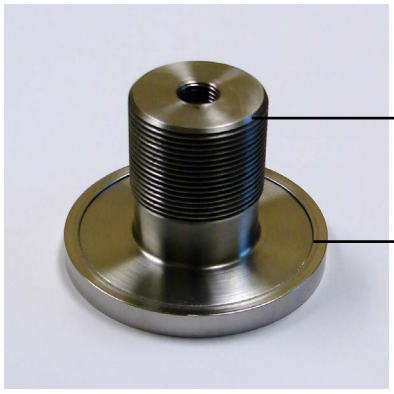
Carbon dioxide and nitrous oxide cartridges are pressurized to approximately 900 PSI at 1 atmosphere (sea level). Therefore, they should never be transported by airplane without proper packing because cabin de-pressurization may cause an explosion.

If the aging cells are going to be rolled in a roller oven during a test, install o-rings on the outer perimeter on the top and bottom of the cells. Failure to do so can damage the rollers in the oven. Teflon (#175-46), Viton® (#175-47), and Buna N (#175-54) o-rings are available.

Operation

1. Assemble the inner cap.

   a. Place the Seal Ring onto the Tension Post with the sharp edge pointed down.

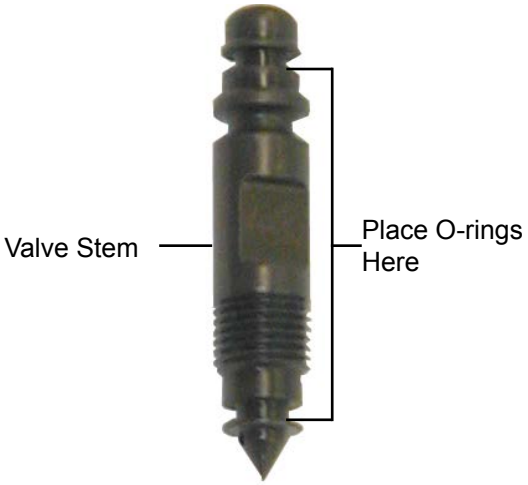


   b. Place the Thrust Ring onto the Tension Post on top of the Seal Ring.

   c. Place the Thrust Washer on top of the Thrust Ring.

   d. Screw the Tension Ring onto the Tension Post. Tighten it finger tight.

2. Inspect the o-rings on the valve stem. Replace any that show signs or damage or wear.



3. Blow air through the valve stem to make sure it is not plugged.

4. Screw the valve stem into the Tension Post and tighten it completely.

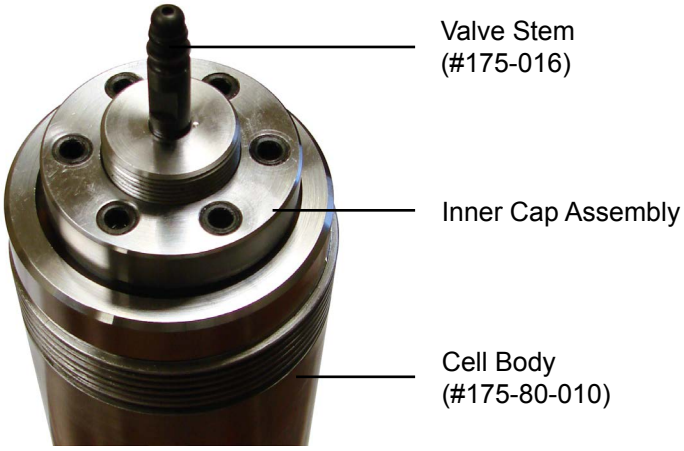
5. Determine the safe volume and initial pressure for the test temperature. Refer to the chart on page “Specifications” on page 4.

6. Fill the cell with fluid.

Important

Do not overfill the cell.

7. Clean any spilled fluid from the edge of the cell and place the inner cap assembly onto the cell body.



8. Screw the outer cap onto the cell body and tighten it hand tight.

9. Tighten the set screws in a star pattern.

The first time you use the aging cell, use a torque wrench to tighten the set screws to 80 lb of torque. For subsequent tests, tighten them to 40 lb of torque.

10. Loosen the valve stem one half turn to open it for pressurization.

11. When the cell has reached test pressure, close the valve stem by tightening it with a wrench.

12. To ensure there are no leaks, immerse the cell in water and check for any bubbles coming from the valve stem or cell cap.

13. Place the Aging Cell inside the oven and set the temperature.

14. At the end of the aging process, remove the cell from the oven and allow it to cool until the sample temperature is 150°F (65.5°C) or less.

The sample temperature must be below the boiling point before you release the pressure and open the cell.

15. Slowly open the valve stem to release the pressure.

Be very careful when releasing the pressure. Make sure the valve stem is pointed away from people and equipment.

16. Loosen all six set screws.

17. Unscrew the outer cap and remove the inner cap.

18. Clean the valve stem with water. Blow air through the stem to remove any residual water.

19. Thoroughly clean the entire cell with water and an appropriate solvent.

Maintenance

Regular maintenance will extend the useful life of the aging cells.

After every test:

1. Thoroughly clean and dry all components, particularly the cell body, tension post, and seal ring.

2. Apply grease to the threads on the outer cap, cell body, tension post, and tension ring.

Every three years (yearly for highly corrosive conditions):

1. Sand blast the metal components (cell body, tension post, seal ring, and outer cap).

2. Visually inspect the cell body, tension post, and seal ring for pitting or other signs of corrosion. If any material loss is present, replace the damaged component.

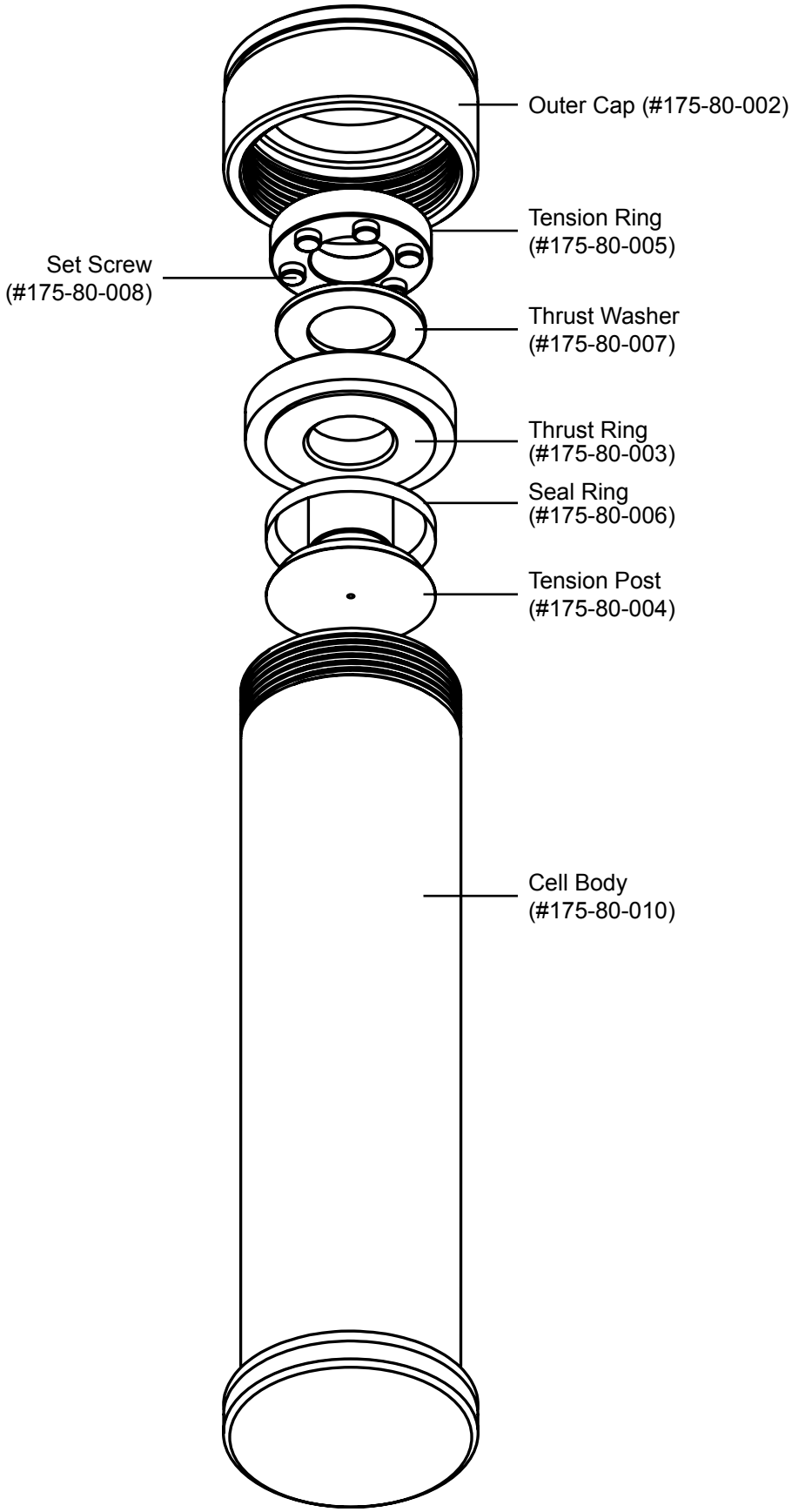
3. Inspect the threads for burrs.

4. Pressure test with water up to 3,000 PSI.

OFITE offers aging cell recertification that includes all of the above plus a one-year certificate. Contact your sales representative for more information.

Appendix

Diagram



Warranty and Return Policy

Warranty:

OFI Testing Equipment, Inc. (OFITE) warrants that the products shall be free from liens and defects in title, and shall conform in all respects to the terms of the sales order and the specifications applicable to the products. All products shall be furnished subject to OFITE's standard manufacturing variations and practices. Unless the warranty period is otherwise extended in writing, the following warranty shall apply: if, at any time prior to twelve (12) months from the date of invoice, the products, or any part thereof, do not conform to these warranties or to the specifications applicable thereto, and OFITE is so notified in writing upon discovery, OFITE shall promptly repair or replace the defective products. Notwithstanding the foregoing, OFITE's warranty obligations shall not extend to any use by the buyer of the products in conditions more severe than OFITE's recommendations, nor to any defects which were visually observable by the buyer but which are not promptly brought to OFITE's attention.

In the event that the buyer has purchased installation and commissioning services on applicable products, the above warranty shall extend for an additional period of twelve (12) months from the date of the original warranty expiration for such products.

In the event that OFITE is requested to provide customized research and development for the buyer, OFITE shall use its best efforts but makes no guarantees to the buyer that any products will be provided.

OFITE makes no other warranties or guarantees to the buyer, either express or implied, and the warranties provided in this clause shall be exclusive of any other warranties including ANY IMPLIED OR STATUTORY WARRANTIES OF FITNESS FOR PURPOSE, MERCHANTABILITY, AND OTHER STATUTORY REMEDIES WHICH ARE WAIVED.

This limited warranty does not cover any losses or damages that occur as a result of:

- Improper installation or maintenance of the products
- Misuse
- Neglect
- Adjustment by non-authorized sources
- Improper environment
- Excessive or inadequate heating or air conditioning or electrical power failures, surges, or other irregularities
- Equipment, products, or material not manufactured by OFITE
- Firmware or hardware that have been modified or altered by a third party
- Consumable parts (bearings, accessories, etc.)

Returns and Repairs:

Items being returned must be carefully packaged to prevent damage in shipment and insured against possible damage or loss. OFITE will not be responsible for equipment damaged due to insufficient packaging.

Any non-defective items returned to OFITE within ninety (90) days of invoice are subject to a 15% restocking fee. Items returned must be received by OFITE in original condition for it to be accepted. Reagents and special order items will not be accepted for return or refund.

OFITE employs experienced personnel to service and repair equipment manufactured by us, as well as other companies. To help expedite the repair process, please include a repair form with all equipment sent to OFITE for repair. Be sure to include your name, company name, phone number, email address, detailed description of work to be done, purchase order number, and a shipping address for returning the equipment. All repairs performed as "repair as needed" are subject to the ninety (90) day limited warranty. All "Certified Repairs" are subject to the twelve (12) month limited warranty.

Returns and potential warranty repairs require a Return Material Authorization (RMA) number. An RMA form is available from your sales or service representative.

Please ship all equipment (with the RMA number for returns or warranty repairs) to the following address:

OFI Testing Equipment, Inc.
Attn: Repair Department
11302 Steeplecrest Dr.
Houston, TX 77065
USA

OFITE also offers competitive service contracts for repairing and/or maintaining your lab equipment, including equipment from other manufacturers. For more information about our technical support and repair services, please contact techservice@ofite.com.